



# FEDERAL-STATE COOPERATIVE SNOW SURVEY AND IRRIGATION WATER FORECASTS

FOR

MONTANA and NORTHERN WY OMING

Upper Missouri and Upper Columbia River
Basins

Report Prepared by

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Soil Conservation Service

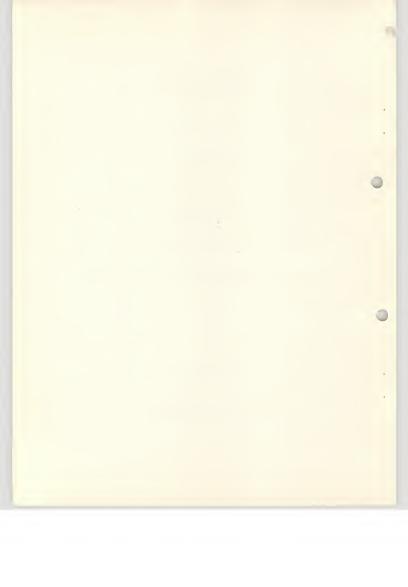
and

O. W. Monson: Head, Agricultural Engineering Montana State College

Division of Irrigation Soil Conservation Service

and

Montana Agricultural Experimental Station Bozeman, Montana



# OUTLOOK FOR 1951 As of March 1, 1951

In most of the River Basins of the Upper Missouri and Upper Columbia the outlook for Irrigation Water Supply is good. The Musselshell Basin and parts of the Beaverhead look a little short. There will NOT be as much water as in 1950 or 1949 and possibly less than 1948. The Snow Survey data show there is close to an average Snow Pack based on 16 years of records.

Precipitation in Western Montana has been above average this season to date while Central and Eastern Montana precipitation from valley stations is below average. Precipitation at Valley Stations in Northern Wyoming has been considerably below average while the

snow pack is relatively close to Average or above.

Reservoir Storage is generally Good for this time of season and better than last season. Stream-flow has been above the median throughout the entire season to date with same exceptionally high flows in mid-February due to a prolonged Chinook'.

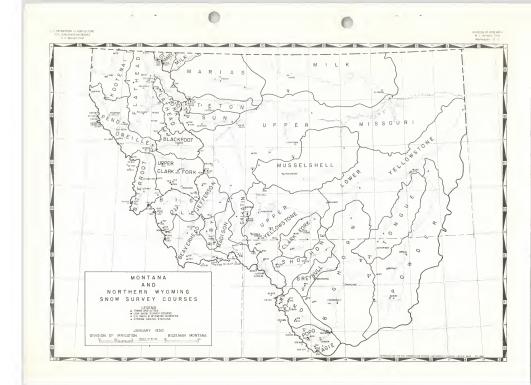
The Snow Fack on the Beaverhead River Basin as of March 1 is relatively GOOD. The Red Rock River Basin is a little short while the Horse-Prairie Big Hole and Wise River Basins range from 50% to 25% above the average. The Ruby River Basin is a little short this season with the snow pack about 10% below average for this time of season.

The snow Pack on the Madison and Gallatin River Basins is very close to the average for the first of March based on 18 years of records. On the Main Stem of the Missouri from Three Forks to Fort Benton the Tributsries from the East indicate a below average condition while those from the West indicate an above average condition. The valley  $^{\rm Precipitation}$  being a strong mimus departure from average over most of the Central part of the State. The Teton, Sun end Marias River Basins have a fair snow pack, Averaging close to 15% and 20% of average.

The Upper Yellowatone River Basin has a Fair Snow Pack for the first of March. The Water Content in this basin is close to Average. Most of the measurements are less than 1950 and 1949 but close to 1945. Tributary Basins to the north are quite low in Water content while those to the South in Yellowstone Park are slightly above normal.

The Lower Yellowstone River Essin Consisting of the Wind, Big Horn Shoshone, Powder and Tongue Rivers Hes a GOOD peck of snow for Merch 1. The Wind and Popo Aggie are in excellent condition with water content measurements averaging about 30% above normal. The Big Horn is about Average conditions. The Shoshone is slightly above average. The Tongue and Powder Rivers are a little below average. Precipitation at the valley stations over the Lower Yellowstone Essin is consistantly below normal by inches at many stations. It is hoped spring and summer rains will be above average this coming seasor.



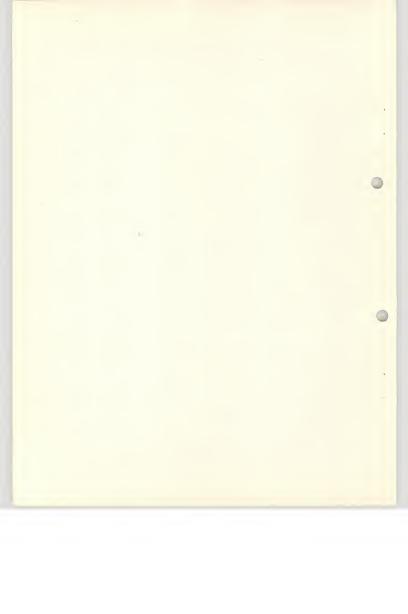


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Lucciaew Carp n	1154		15 15	1L3 1L3 58	28		5,47,45 3,44 3,4 5,4		Jul Creek	783		30 30 25	131 131 101	101%	19L8 19L8 1946	2,3,4,5 2,3,4,5 1,5 145	Pd.Cbe.
MILL Fine Rije	1151		10	1.3	9.8	1 19Lo	31E	1	Junter Greek Henjer Greek	982 781		25 32 28	1,917 1,731 58.11	103W 86W	1918		1
LADOUT DIOK	15010	0400 6100	12 11	58 68	103		3.4	1	Wood Haver S. oBdools sloke) V	9F7	8000	28	Lon	105W	1939	2,3,4,5	ī
Print Pess versil Dress	1332 1381 13012				158		3,L 3,L 3,L 5,L	1	East Entrance Sylvan Fass	10Ec 10E5	7000	17	52% 5211	109# 110W	19LB 1956	1,2,3,4,5	5
Jan Junet in				38 108 68	15W 15W	1950	5.1	1	TONGTE RIVER WYO.	762				Bow.			1
									Bi: Toose PUNDER RIVER WYO.		7700	li	58 N		1935	4,5	-
Fig this Pess it, sie Pess(Nelov East Soundery	1305 1130L 1305	7LL0 6900 6700	26 21, 22	38 38 38	15W 15W 17W	1953 1958 1958	3.L 3.L	1	Ped Fork Sour Dough	7E1 0E1	7000 8500	18 17	Low	85 <b>w</b> 81, <b>w</b>	1936	145 145	Pd.Cbs.
Tirbons Pass Jan ze Creek	1302 1303	7100 73L0		28 78	19W 10W	1934 1948	3.L 3.L 2.3.b.5 3.4	1,2									
"iner forks "iner lake	1300 1307		25 21 10	08	17W 10W	1958 1955	3,4	1									
MISE PIVEPJ							- 1		Borre Tountain	1581		Columbia	River 258	Basin 51W	1937	b.5	1
Anderson "dw. Flk forn Alse Hiror			16 15 15	38 LS 28	12W 12W 12W	1955 1955 1968	3,45 3,45 3,4	1 2 1	Blue Bird Pasin	1/A1	0000 0800 5000		5731 5011	26W	1957	1,5 1,5 3,4 3,4,5	1
								1	Red Fountain	1541	6000		30N	538	1937	3,4,5	1
Osttanopod (Upper)	11E2 11E1	5900 6L00	21, 30	108	3 N 2 W	1948 1948	3,4 3,4 3,4,5	1	See Carrie	1313 LuAL	6750 5000	13	223	18W 25W	1911	1,5 3,1	4
.les di_nt To_ new Root Vi ilante	1235 1212 1131	6950 6900 6125	22 13 28	88 Las 98	7M 5W	1915 1918 1918	3,4,5 3,4 3,4	1	Brush Creek Cattle queen Dezert Kountain	13A1 13A2 13EL	5000 L700 5600		35N 31N	17W	1939 1937 1911	3,4 1,2,3,4,5	5
AND ADVER									Elk Mountain Jost Mountain		6750 7000	20	55M	19W	191,1 1931, 191,2	3.4 3.4	Ĺ 2
+b_en Aust Yellowstone	1185 1187	6550 6700	22 34 110-111	118 138	3£ 58	1931 1931 1935	1,2,3,4,5 1,2,3,4,5 3,4	2	Hell Rowring Divide Kishenehn	11,43 11,42	5770 1,500 7000	35 7	32N 37N	22W 21W	1916	1 <sub>4</sub> 5 1 <sub>4</sub> 5	5
SALLATIN RIVER	10E2	7500	tota -topo		110°-L2*			5,0	Limestone Pass Logan Creek	1598 1546	1300	3L 3L 3L 3	30N	15W 21W 11W	1918 1937 1981	3,4 3,4	1
Devil's Slide Hood Newdow	1000, 1003 1000	8100 0000	14, 22	58 L/S	30 30	1935 1934	3,4,5 3,4,5 2,3,4	2,0 2,0 0,7	Marise Pase North Fork Jocko	1385 1387 1380	5250 6330 1300	31	17N 189	17# 16#	1914	1,2,3,4,5	li I
Mystic Lake New World		0500	30 21,	38 38	7% oE	1935 1939		0,7 0,7 2	Rainy Lake Snow Lab. # 16 Scotted Bear Nt.	13A9 1382	5200 7000	15 23	29N 25N	1.Lw	1916 1918	3,4 3,4,5 1,2,3,4,5 3,4	2
21-"ile ISSOURI RIVES "AIN		7150	1	118	58.	1931	1,2,3,4,5		Strawberry Lake	13810 1381	6500	11	28N 25N	19W 17W	1918		1
Chesanan Reservoir Crystal Lake	12¢5 9¢1	o200	2 2),	8M 12M	5W 17E	193a 1941	1,2,3,4,5 3,4	2	Trout Lake Upper Holland Lake	13811	3600 7000	21 28	28N 20N	17W 16W	19L8 19L8	3.L 3.L 3.L	1
Brashopper Eings Hill	1002	7000 7950	21, 19 35 22 11	91 131	8E 7%	1938 1937	3.4. 3.4. 3.4.5	2	TRPER CLARK FORK Chesenan Reservoir	1265	6200	2	Re	SW	1916	1,2,3,l,5	2
Picnic Grounds Papestone Pass	1205 1201 1201	0500 7200	11	5H 13	0M 7M 7M	191,0 1938 1931	2,3,1,5 2,3,1,5 3,1,5 1,2,3,1,5 1,2,3,1,5	1 2	East Fork Ranger St	tm13D1	5500 7800	16	2 M	179	1937 1916	1	11
Stemple Pags Tegmile Greek,Lower Tegmile Greek,Fidil	1201	6250 6860	10 13 13	15N 8N	OM VM	1935 1935 1935	1,2,3,4,5	2	Gold Creek Lake Interseard	1308 130h	7200 6150	23 11 <sub>6</sub> 6	8N 5M	12W	1916	2,3,4	11
Tennile Creek, Upper (Third RIVER)	1200	8000	19	BN	5W	1935	1,2,3,4,5	2	North Fork Josko Picnic Grounds	1397 1205	6330 6500	3 22	17N 5N	17W	191d 1910	3,1 2,3,1 2,3,1,5	1.
Fright Creek Wildron Creek	12A1 1212	6000 5000	13 10	25 N	10%	1948 1948	3.4	1	Pipestone Pass Rainy Lake	12D1 13B6	7200 1,500	11	1N 18N	7M 16M	1938 1947	3,4,5	1
West Fork (SUL RIVER)	1211	9000	-6	25%	98	1948	5 a la 5 a la	1	Skalkeho Summit Slide Rock Mountain Southern Cross	1303 n 1302 1305	7258 7100 6500	30 26 9	6N 10N	17W 16W 15W	1937 1937 1939	L L 2.3.1	1
Dench Mark	1226	5500 5500	9	2011	10M	1948	3,4	1	Stemple Face Stemple Face Storm Lake No. 2	1305 1301 1207	6900 7780	16 19 19	53 13 K	7W 13W	1939 1931 1939	3,1,5	2
Dabin Greek 5-Bull Gates Park	1230 1239	5000	33 30 31 20	23N 20N	108	19L9 19LB	3,L 3,L 3,L	1	Stoart Mill Stoart Mountain #1	1305	6500 71,00	19	5N 1LH	15W	1939	2,3,4	5
Jost Mountain	1235 1237 1539	5300 7000 7300	20	21/H 22/H 25/H	10M	191 <i>9</i> 1931 1950	3.L 3.L	2	Tennile Creek,Lower Tennile Creek,Miidl	r 1202 1+1203	6250	13 13	811 810	6W 6W	1935	1,2,3,1,5	5
My Lake Wrong Creek Ridge Wrong Creek	1235 123L	6800 5700	21 17 12	25N 25N	10%	1919	3,4	1	Tennile Oreek, Upper FEI'D OREILE RIVER	r 12CL	8000	19	811	58	1935	1,2,3,1,5	2
(MARIAS RIVER) Marias Pass	1345	5250	314	701	17.00	1950	1,2,3,4,5	2	Seres Yountain Fractiont Summit	1581 1608	6000	21	25N	318	1937 1937	lu5 li	1
Snow Lab. #10 (VILE RIVER)	1349	5200	15	29 N	1138	1956	1,2,3,4,5	5 5	Hoodoo Creek Bilimagoo River	1301	6200	9010	110	27W	1937	Li Li	1
Rocky Boy	9A1	5200	15	281	108	1961	3,1	7	East Fork R. S.	1301	51,00	16	21	178	1037	li .	1
("USSELSHELL RIVER Transhopper	100%	7000	19	qu	88	1918	3,4	1	Sibbons Pass End Creek Pasture Nesperce Camp	13D2 1L01 1LD2	7100 L500 5580	21, 21, 19820	28 11H	19W 21W	1937	2,3,4,5	1 1
UPPER YELLOWSTONE	901	7890	2	88	188	1987		-	Nesperce Pass Skalksho Sumut	1/D1 1303	0575	32	18 28H 6N	25 W 16 E 17 W	1937 1937 1937	li L	1
Carp Senia Cenyon Cooke City	901 1023 1007	7190 7750 7100	144°=144° 25	98	188 110°=30*	1957 1958 1957 1955	1,2,3,4,5	Pd.Obs.	Stuart Mountain #1	1301	71,00	6	LLM	18#	1936	ii.	1
Crevice Pt. Independence	1005		22 22 110°=31°	98	9E 12E- 110°=2L*	1961	1,2,3,4,5 3,4 3,4	5 1 Pd+Obs+	SI, MARY SIVES	13.68		Lo <sup>o</sup> -50*	wan Ri-	rer Basin 121°-121			
Lake Camp Lodgepole (Wyo.)	10EL 9EL	7850 8200	1770-274 35 1770-274		106W 100-37*	1937	1,2,3,4,5 4,5 1,2,3,4,5	Pd.Obe.	Piegan Pasa # 1; Piegan Pasa # 1;	13A3 33AL 13Ac	5000 5000	1,5°=50* 1,6°=1,6*		113°=1,2° 113°=1,0° 113°=1,0°	1922 1922 1922	5	2,8
Dupine Greek (SHIELDS RIVER)	1011	7300	1410-541		1109-37*	1938		5	Mount Allen # 7 Ptermigen # 8	13A7 13A6	7000 5800	180-171		113°=12° 113°=12°	1988 1988 1988	5	2,8 2,8 2,8
Porcuring LORS TELLOSTORE	1003	0500	10	148	10%	1958	3,4	1								1	-,-
(NIAD RIVER) Non- Brooks Lake #)	1092	9200	21	LUS.	110W	1919	8,5,4,5	Pris Obs.	a. Sumerals 1,2,3,								nd Fay 1.
Burroughs Creek Dinwoodie Dry Creek	986 9810	8800	25 15 9 34 27 12	13 N 38 N	107W 105W	1918 1918	2,3,4,5	Pd.Obs. Pd.Obs.	b. Womersle refer				he mo	w survey	as follow	*:	
Dry Creek DuNoir leyser Creek	9F9 9F2 9F3	9500 8750 8500	31 <sub>4</sub> 27	Las Las Las	105W	19L8 19L0	2,3,4,5 2,3,4,5 2,3,4,5	Pd.Obs. Pd.Obs. Pd.Obs.	1. t 2. t 3. t	D. S. Fore D. S. Geol Fontama Po	est Serv	iee Survey a	und U.	8. Engine	er Corps		
				28	105W 3W	1918 1918	2,3,4,5	Pd.Obs.	I <sub>2</sub> 1	D. S. Indi	an Serv	ice					
Little Warm Mosquito Park R.S.	974 903 971	9500 9500 7500	2L 23	1,13 28 1,29	108W 3W	19LB 19LD	2,3,4,5	Pd.Obs. Pd.Obs.	5. 1 7. 1	fontana En	chelinen chelinen	t Statio	et.				
Mosquito P-rk R.S. Sheridan R. S. St.Lawrence R.S. T-Gross Ramch	9F11	9000	26	18	109W LW 107W	1939 1940	2,3,1,5 2,3,1,5 2,3,1,5	1 Pd.Obs. Pd.Obs.	7 · 9 · 1 · 9 · 1	fontana Es Lity of Bo Dominion V D. S. Piet L. S. Bure	Mater an	d Power	Sureau				
Trout Creek	925 951 1071	81,00	1 5	25	2W 110W	1928	2,3,4,5 2,3,4,5 2,3,4,5	Pd.Obs.									
	WYO. 802	9500	21	31N	1018	1930		1	Pile Olde 1	Paid Obser	wer by	Soil Com	eerrat	ion Servi	10		
Grannier Meadows	937 935	9500 9000 9000	19 12	31N 30N 30N	101W 105W	1939 1936 1918	2,3,4,5	1 1									
Lerson Creek Sawmill Glade South Page	801 803	8500 9000	3	31% 30%	101#	1939	2,3,4,5 3,4,5 2,3,4,5 2,3,4,5	1									
			~	,		****	-1/14/	-									

#### STORAGE IN RESERVOIRS OF MONTANA AND MORTHERN WYOMING Reservoir Volumes in 1,000's of acre feet

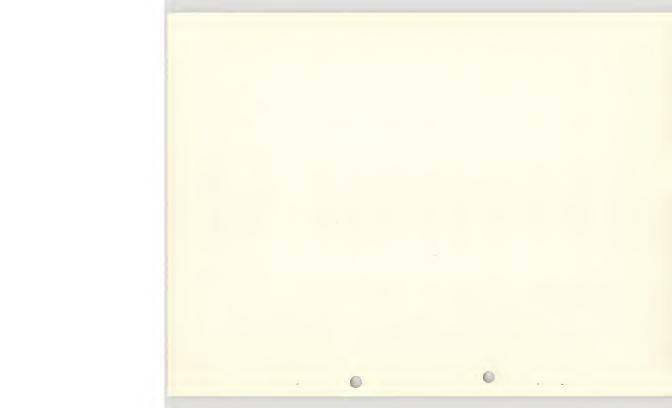
			Tunes In 1,00	1	0 1000
RESERVOIR	Location or on	Usable	Contents	Contents	March 1
	Diverson from	Capacity	this Year	Last Year	
			March 1	March 1	Average
			1951	1950	1940-49
Lake Sewall	Missouri	37.8	19.3	32.1	
Hauser Lake	Missouri	52.1	48.7	42.7	46.4
Holter Reservoir	Missouri	81.9	65.1	49.8	55.5
Fort Peck Res.	Missouri	19.000.0	12,430.0	11,490.0	
Ruby Reservoir	Ruby	38.5	22,4,5000	11,4,500	203147181
Hebgen Reservoir	Madison River	345.0	230.8	206.8	240.8
Madison Reservoir	Madison River	41.0	35.2	38.7	34.4
Smith River Res.	Smith River	10.7	7700	50.01	24 04
Gibson Reservoir	N.Fk.Sun River	105.0	81.5	40.6	64.2
Willow Creek	N.Fk.Sun-Willow Cr.	32.3	23.8	3.0	13.0
Pishkun Reservoir	N.Fk.Sun River	32.0	18.9	18.9	17.4
Lower Two Medicine I		14.0	10.9	10.9	T ( +t)
Four Horns Res.	Badger Creek	20.0			
Birch Creek Res	Birch Creek	30.0	28.1	30.7	03.0
Lake Francis Res.	Birch Creek	112.0		19.3	21.0
Askley Lake	Judith River		93.5	82.0	75.9
Durand Res.		5.8		4.4	4.3
Dead Man Basin	N.Fk.Musselshell	7.0	5.5		
Martinsdale Res.	Musselshell River	52.5			
Fresno Res.	So.Fk.Musselshell	23.1	12.4	10.1	9.3
Nelson Res.	Milk River	127.2	65.9	12.1	44.4
	Milk Reservoir	66.8	15.7	4.8	31.3
Mystic Lake	W.Rosebud Creek	20.8	8.7	8.6	8.4
Cooney Res.	Rec Lodge Creek	27.5	8.4	12.4	9.2
Tongue Reservoir	Tongue River	73.9		5.5	8.9
Sherburne Lake Res.	Swiftcurrent Creek	66.1			17.9
Lake Hellen	Missouri River	10.4	8.6	5.8	
Buffalo Bill	BASIN (Wyoming) Shoshone	1.54 (	205.0	005.0	20-1
Pilot Butte	Wind River	456.6	295.0	205.9	297.4
Bull Lake		30.1	8.4	5.9	13.8
COLUMBIA RIVER B	Wind River	155.0	89.5	99.4	62.3
Georgetown Lake	Flint Creek	71.0	07.0	30 -	30 5
E.Fk.Rock Cr.Res.	E.Fk.Rock Creek	31.0	23.0	18.5	18.7
W.Fk.Bitterroot Res.		16.0	20.0	- /	- /
Como Lake	Rock Creek	31.7	10.0	0.6	7.6
Flathead Lake (Sommer		34.8	000 =	(50 -	71.0.0
*Little Bitterroot	Little Bitterroot	1,791.0	902.7	657.5	342.2
		37.1	34.7	33 • 3	14.9
*Dry Fork Res.'s  **Mission Valley	Dry Fork Creek	6.7	4.4	4.0	2.3
9 Reservoirs	Mission Valley	305.0	1 - 0	11 -	
y meservoirs	(Flathead River)	105.0	49.8	44.1	37.0

<sup>\*</sup>Comprised of two reservoirs on Little Bitterroot river
\*Comprised of two reservoirs on Dry Fork Creek.
\*\*Comprises nine small reservoirs on Mission Valley Indian Irrigation Service Project.



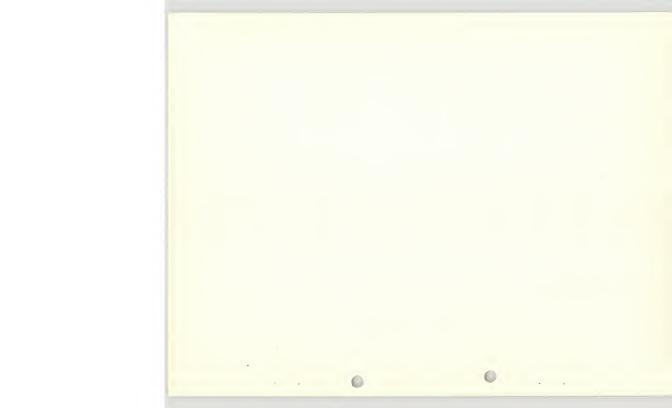
PRECIPITATION DATA FOR MARCH 1, 1951 MONTANA

			1950			1951			nal Accum	ulation
Station	Elev-		cipitat:		Jan.	Feb.	Dept. from	Precipi	tation	
	ation	Oct.	Nov.	Dec.			Normal	1950-51	Normal	Departur
WEST OF DIVIDE										
Butte (Airport)	5533	0.53	1.20	0.59	0.92	0.82	+0.40	4.06	2.49	+8.57
Phillipsburg	5280	0.51	1.25	0.64	1.43	1.45	+0.81	5.28	4.05	+1.23
Hamilton	3529	1.78	1.58	0.71	1.21	1.52	+0.81	6.80	3.97	+2.83
West Glacier	3154	5.87	2.35	5.17	4.77	4.88	+2.75	23.04	13.45	+9.59
Summit (Marias)	5213	7.53	6.13	5.88	5.37	6.52	+3.07	31.43	14.26	+17.17
Ovando 1 SW	4101	1.02	2.38	1.63	1.53	1.72	+0.37	8.28	7.45	+0.83
Trout Creek	2485	6.36	3.95	4.67	5.42	6.51	+3.69	26.91	16.72	+10.19
Thompson Falls	2435	4.36	2.79	2.25	2.97	3.44	+1.06	15.81	9.64	+6.17
Average (8)		3.50	2.70	2.69	2.95	3.36	+1.83	15.20	9.00	+6.20
CENTRAL DIVISION										
Babb	4300	1.04	1.23	0.85	0.65	1.79	+0.97	5.56	4.87	+0.69
Havre	2488	0.24	0.41	0.32	0.39	0.1,2	-0.08	1.77	3.12	-1.35
Great Falls (Airport)	366L	0.03	1.19	0.58	0.41	1.34	+0.79	3.55	3.37	+0.18
Helena (Airport)	3893	0.43	1.50	0.61	0.38	0.24	-0.13	3.15	2.48	+0.67
Lewistown (Airport)	4132	0.74	0.83	1.05	0.17	0.20	-0.57	2.99	2.27	+0.72
Livingston	4485	0.94	1.05	0.81	0.38	0.40	-0.20	3.58	3.65	-0.07
Wisdom	6058	1.06	1.15	0.48	0.71	0.93	+0.40	4.33	3.75	+0.58
West Yellowstone	6669	2.88	1.79	1.95	2.28	1.91	+0.24	10.81	10.50	+0.30
Mystic Lake	6558	0.86	2.37	1.08	2.02	0.17	-0.81	6.50	6.68	-0.18
Average (9)		0.91	1,28	0.85	0.82	0.82	-0.03	4.69	4.52	+0.17
EASTERN DIVISION										
Malta	2255	0.39	0.18	0.35	0.49	0.52	+0.06	1.93	2.144	-0.51
Ft. Peck	2180	0.24	0.25	0.23	0.48	0.39	+0.12	1.59	2.15	-0.56
Medicine Lake	1962	0.50	0.10	0.21	0.36	0.49	+0.17	1.66	1.99	-0.33
Circle	2428	0.54	0.18	0.13	0.33	0.50	-0.11	1.68	3.45	-1.77
Billings #2	3139	0.83	0.88	0.68	0.70	0.38	-0.12	3.45	3.60	-0.15
Miles City	2392	0.40	0.52	0.31	0.08	0.27	-0.36	1.58	3.25	-1.67
Glendive	2076	0.45	E0.16	0.07	0.37	0.42	-0.01	1.47	2.75	-1.28
Broadus	3026	0.46	0.41	0.40	0.48	0.31	-0.17	2.06	3.04	-0.98
Average (8)		0.48	0.34	0.30	0.41	0.41	-0.40	1.93	2.83	-0.90



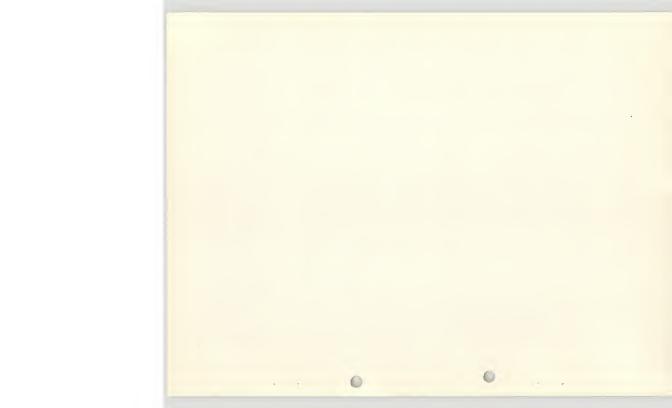
PRECIPITATION DATA FOR MARCH 1, 1951 NORTHERN WYOMING

			1950			1951		Seaso	nal Accum	ulation
Station	Elev-	Pre	cipitat:	ion	Jan.	Feb.	Dept. from	Precipi	tation	
	ation	Oct.	Nov.	Dec.			Normal	1950-51	Normal	Departure
BIG HORN RIVER BASIN Cody Lovell Worland Sunshine li SW Thermopolis Riverton Dubois Average (7)	4984 3825 4061 6930 4336 4954 6917	.08 .02 T .17 .19 .22 .37	1.29 .32 .10 1.04 .80 .57 .71	.28 .03 .140 .29 .21 .00 T	.77 .09 T .37 .07 .05 .16	0.09 T 0.10 0.67 0.18 0.31 0.45 0.25	-0.22 -0.27 -0.16 +0.06 -0.22 +0.06 +0.01 -0.11	2.42 0.46 0.60 2.54 1.34 0.89 1.37 1.37	2.12 1.48 1.93 3.96 2.94 2.26 2.144 2.49	+0.30 -1.02 -1.33 -1.42 -1.60 -1.37 -1.07 -1.13
TONGUE RIVER BASIN Sheridan	4021	.51	1.05	58	. 55	0.24	-0.46	2.93	3.89	-0.96
POWDER RIVER BASIN Arvada Metz Ranch Gillette Nine Mile Creek Mid West Average (5)	3680 5280 45142 5000 4850	.22 .37 .63 .70 .83	.31 .67 .72 .40 .47	.06 .19 .05 .05 .28	.16 .46 .50 .20 .23	0.18 0.38 0.25 0.50 0.27 0.32	-0.18 -0.06 -0.19 +0.20 -0.23 -0.09	0.93 2.07 2.15 1.85 2.08 1.82	2.79 2.64 3.43 2.33 3.33 2.91	-1.86 -0.57 -1.28 -0.48 -1.25 -1.09



MONTANA SNOW SURVEYS MARCH 1, 1951

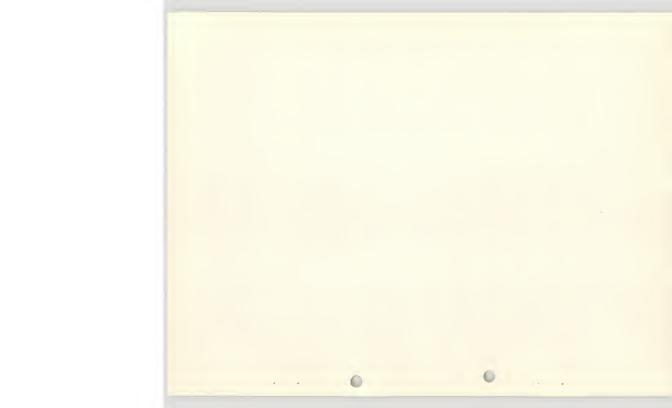
DDATWAGD DAGTY			Date	Snow	7	Water C	ontent	Inches			
DRAINAGE BASIN	No.	Elev.	of	Depth					ge Data	Years	Ground
SNOW COURSE			Survey	(In.)			Records			of	Surface
			1951	1951	1951	1950	1949	Avg.	%Avg.	Record	Condition
JEFFERSON RIVER						Sept.					
(Rock-Beaverhead)											
Lakeview Ridge	11E3	7400				1				ì	
Lakeview Canyon	11E4	6930									
Limekiln	11E2	6950	Feb. 8	2.5	0.8	1.0	2.6	1.5	53	3	G.F.
White Pine Ridge	1131	8850	Feb. 8	15.0	3.0	5.0	6.0	4.7	64	4	G.N.F.
*Kilgore	11E12	6200	Mar, 1	36.0	7.4	7.9	9.7	8.9	84	15	
*Camp Creek	12E3	6800	Feb. 28	29.0	6.0	11.9	10.5	8.1	74	16	
*Blue Ridge Mine	11211	6700									
(Horse Prairie)											
Bloody Dick	13D10	7600	Feb. 15	46.8	13.2	8.5	13.9	9.8	135	4	G.N.F.
Gold Stone	13D9	8100	Feb. 13	60.6	17.8	10.4	15.6	12.5	143	4	G.N.F.
Lemhi Pass	13E1	7400	Feb. 10	35.2	9.4	5.4	7.9	7.5	125	4	G.N.F.
Terrell Creek	13D12	6650	Feb. 9	24.4	6.6	3.0	4.8	3.4	194	4	G.N.F.
Trail Creek	13E2	7090	Feb. 10	32.8	8.4	4.3	7.0	6.3	133	1	G.N.F.
Selway Junction	13D11	6500	Feb. 9	38.8	9.8	5.4	8.8	6.1	160	1	G.N.F.
(Big Hole)				-							
Big Hole Pass	13D3	7440	Feb. 14	59.8	19.0	12.2	20.9	14.9	128	1 1	G.N.F.
Big Hole Pass (Below)	13D4	6900	Feb. 14	49.0	18.0	11.5	17.9	12.4	145	1	G.N.F.
East Boundary	1305	6700	Feb. 14	29.8	8.1	7.6	9.8	7.5	108	4	G.N.F.
Jahnke Creek	1308	7340	Feb. 13	41.9	12.4	7.7	13.6	9.2	135	1	G.N.F.
Miner Forks	13D6	7300	Feb. 11	45.3	13.4	8.2	14.0	9.5	141	L	G.N.F.
Miner Lake	13D7	6720	Feb. 11	31.7	8.1	5.8	9.4	7.3	111	7	G.N.F.
*Moose Creek	13D16	6200		>1		7.0	/ / -	100		'	-01.010
(Wise River)								1			
Anderson Meadow	13D14	7000	Feb. 16	31.6	8.4	6.8	8.4	7.2	117	4	G.N.F.
Elk Horn	13D15	8450	Mar. 2	39.1	10.4	7.1	12.2	7.5	139	17	-011010
Wise River	13D13	6300	Feb. 16	19.0	5.4	4.2	5.7	4.8	112	1	G.F.
(Ruby River)	-))	0,00	. 000 20	2700	704	400	J°1	4.00		4	Gar.
Cottonwood	11E2	5900	Feb. 24	26.6	6.0	8.6	8.2	7.6	79	4	G.F.
Cottonwood (Upper)	1151	8700	Feb. 24	26.9	5.9	8.9	9.2	8.0	74	4	G.F.
Flashlight	1203	6950	Mar. 2	17.6	4.2	3.2	5.0	3.6		7	G.F.
Tobacco Root	12D2	6900	Feb. 23	30.3					117	4	
Vigilante	1101	6125	Feb. 24		8.1 Snow	5.0	11.0	8.1	100	1 1	G.F. G.F.
ATRITATION	TIDI	0125	1.60. 54	14	o onow	1	. 201	1 1.0		4	U.P.
*Adjacent Besin											



# MONTANA SNOW SURVEYS MARCH 1, 1951

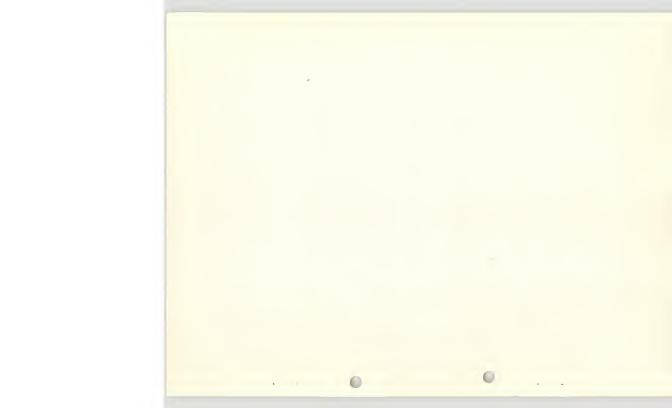
			Date	Snow	7	Vater C	ontent	Inches			
DRAINAGE BASIN	No.	Elev.	of	Depth					ge Data	Years	Ground
AND SNOW COURSE			Survey	$(I_{n_{\circ}})$	Mar. 1		Records	Mar		of	Surface
SNOW COURSE			1951	1951	1951	1950	19/19	Avg.	%AVE.	Record	Condition
MADISON RIVER											
Hebgen	11E5	6550	Feb. 28	36.7	9.1	9.6	14.0	10.7	85	18	
West Yellowstone	11E7	6700	Feb. 28	43.0	11.8	11.7	14.4	9.9	108	18	
21-Mile	11E6	7150	Feb. 28	49.0	14.2	17.1	20.5	13.6	104	18	G.F.
*Big Springs	11E9	6500	Feb. 26	68.0	18.8	20.4	26.4	17.6	107	16	
*Island Park	11E10	3600	Feb. 27	57.0	12.9	17.3	21.8	14.0	92	16	
*Valley View	11 <b>E</b> 8	6500	Feb. 27	45.0	10.3	15.3	17.3	12.5	83	7	
Norris Basin	10E2	7500	Feb. 27	35.8	9.3	8.7	-	8.1	115	12	
GALLATIN RIVER											
Devil's Slide	10DL	8100	Mar. 2	49.2	14.8	12.9	18.1	15.0	99	17	G.F.
Hood Meadow	10D3	6600	Mar. L	24.9	6.6	4.3	8.4	6.4	103	17	G.F.
Mystic Lake	1002	6600	Mar. L	21.3	5.6	3.8	9.8	6.2	91	17	G.F.
New World	10D1	6700	Mar. 4	27.0	7.2	5.3	11.2	8.7	88	10	G.F.
21-Mile	11E6	7150	Feb. 28	49.0	14.2	17.1	20.5	13.6	104	18	G.F.
MISSOURI RIVER MAIN ST	EM										
Chessman Reservoir	1205	6200	Mar. 1	12.7	3.1	3.4	7.1	4.4	70	16	
Crystal Lake	901	6100	Mar. 2	30.8	7.5	5.3	15.1	10.3	73	11	
Grasshopper	1002	7000	Feb. 28	13.4	3.0	3.8	7.3	4.2	71	14	
Kings Hill	1001	7950	Feb. 28	39.7	9.9	12.0	15.1	10.3	96	18	
Pipestone Pass	12D1	7200	Feb. 28	27.7	5.3	1.8	6.8	4.0	132	14	
Stemple Pass	1201	6900	Feb. 28	35.9	9.1	8.2	12.1	8.0	111	18	
Tenmile, Lower	1202	6250	Mar. 2	26.0	6.6	5.4	8.1	5.6	118	17	
Tenmile, Middle	1203	6800	Mar. 2	39.6	9.7	8.4	11.2	8.1	120	18	80
Tenmile, Upper	1204	8000	Mar. 3	45.0	12.9	10.6	13.2	10.4	124	17	
(Teton River)											
Fright Creek	12A1	6000	Feb. 28	58.2	18.6	18.2	15.3	15.3	122	4	G.N.F.
Weldron Creek	12B2	5600	Feb. 27	28.6	8.7	9.6	6.8	7.0	124	4	G.N.F.
West Fork	12B1	6000	Feb. 27	57.4	19.6	16.8	16.6	14.4	136	4	G.N.F.

<sup>\*</sup> Adjacent Basin



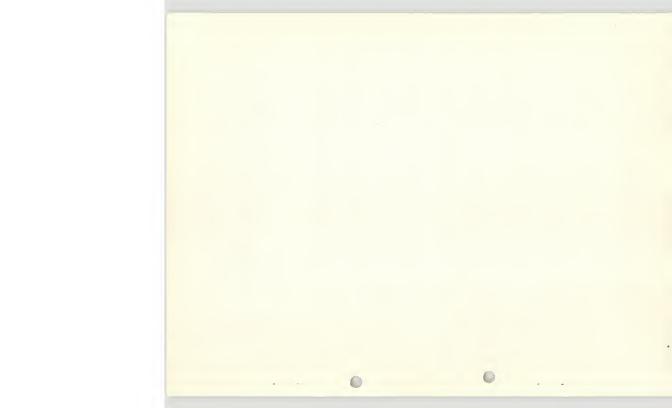
### MONTANA SNOW SURVEYS MARCH 1, 1951

DRAINAGE BASIN			Date	Snow	W	ater Co	ontent	(Inches	)		
AND SNOW COURSE	No.	Elev.	of Survey	Depth (In.)			Records	Mar	ge Data ch 1	Years of	Ground Surface
SNOW COURSE			1951	1951	1951	1950	1949	Avg.	%Avg.	Record	Conditio
(Sun River)											
Benchmark	12B8	5500	Feb. 26	34.6	10.0	10.5	9.0	8.8	114	4	G.N.F.
Cabin Creek	12B6	5400	Feb. 27	28.7	7.8	7.2	6.2	7.1	110	3	
5-Bull	12B9	5600	Feb. 26	28.6	7.7	7.8	6.9	7.5	102	4	G.N.F.
Gates Park	12B5	5300	Feb. 28	38.1	11.5	10.8	9.8	10.7	107	3	
Goat Mountain	12B7	7000	Feb. 28	39.4	11.9	13.2	11.2	8.3	143	18	
My Lake	13B9	7300	Mar. 6	104.5	39.1	46.5				2	GF
Wrong Ridge	12B3	6800	Mar. 2	65.9	21.0	26.0	20.9	22.6	93	3	
Wrong Creek	12B4	5700	Mar. 1	48.2	16.4	17.6	14.4	16.1	102	3	
(Marias River)											
Marias Pass	12B5	5250	Feb. 28	58.1	20.2	24.3	20.5	14.4	140	18	
Snow Lab. #16	13A9	5200									1
(Milk River)							1				
Rocky Boy UPPER YELLOWSTONE	9A1	5200	Mar. 1	11.8	2.9	3.5	4.4	4.8	60	11	
Canyon	10E3	7750	Feb. 28	52.3	14.0	14.1	13.4	13.0	108	6	
Cooke City	10D7	7400	Mar. 1	29.6	7.7	5.8	9.3	6.5	118	15	
Crevice Mt.	1CD5	8400	Mar. 1	30.0	7.1	7.5	11.4	8.2	87	13	G.F.
Independence	1006	8000									
Lake Camp	1CE4	7850	Mar. 1	35.0	8.8	10.1	12.5	8.1	108	15	
Lupine	1CE1	7300	Feb. 27	31.2	7.1	9.2	13.3	8.2	87	13	
*Lewis Lake Divide	10E9	7000	Feb. 28	116.0	42.2	45.4	47.3	37.9	111	33	
*Tom Thumb Summit	10E7	7900	Feb. 28	63.0	21.0	24.5	23.3	22.1	95	14	
(Shields River)											
Porcupine	1003	9200	Mar. 3	16.2	3.5	3.4	8.0	4.4	79	13	G.F.
(Musselshell River)											
Grasshopper	1002	7000	Feb. 28	13.4	3.0	3.8	7.3	4.2	71	14	



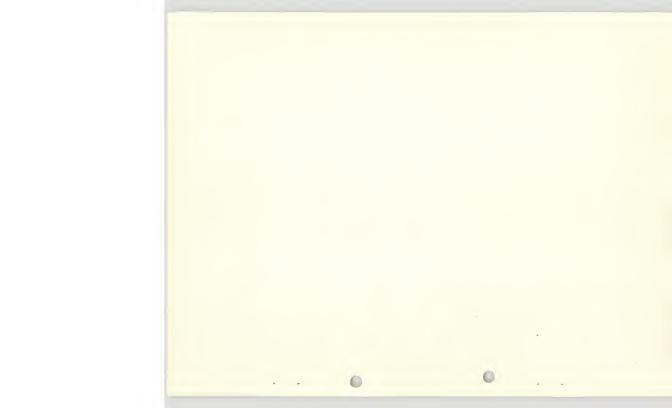
# MONTANA SNOW SURVEYS, MARCH 1, 1951

MISSOURI BASIN											
DRAINAGE BASIN			Date	Snow	V	later Co	ontent (	Inches		v	
AND	No.	Elev.	of	Depth	W 2	De et T			ge Data	Years	Ground Surface
SNOW COURSE			Survey 1951	(In.) 1951	Mar. 1 1951	1950	Records	Ave	%Avg.	Record	Condition
			-1//-	-//-	//-	17,70	1/4/	31160	7-4460	1100014	JOHAT DI DI
LOWER YELLOWSTONE											
(Wind River)						-//					
Brooks Lake #3	10F2	9200	Feb. 28	79.3	28.2	26.6	22.5	18.1	157	15	G.F.
Burroughs Creek	9F6	8800	Feb. 27	69.5	23.0	16.0	13.5	17.5	130	3	G.F.
Dinwoodie	9F10		Mar. 2	51.2	17.5	14.6	10.8	14.3	122	3	G.F.
Dry Creek	9F9	9500	Mar. 2	30.4	8.6	9.0	5.9	7.8	110	3	G.F.
Du Noir	9F2	8750	Feb. 27	37.3	10.3	11.2	9.3	7.8	131	11	G.F.
Geyser Creek	9F3	8500	Mar. 1	36.6	11.3	10.1	8.4	9.9	114	3	G.F.
Hobbs Park	9G2	10000	Feb. 23	53.0	16.4	23.7	19.5	19.9	82	3	G.F.
Little Warm	9F4	9500	Mar. 1	62.1	21.3	18.7	13.7	17.9	120	3	G.F.
Mosquite Park	9G3	9500	Feb. 23	27.7	6.8	11.3	10.3	8.2	83	8	G.F.
Sheridan Creek R.S.	9F1	7500	Feb. 28	35.7	10.6	7.4	8.6	5.5	193	15	G.F.
St. Lawrence R.S.	9F11	9000	Feb. 24	19.9	4.4	8.2	9.0	6.7	66	8	G.F.
T-Cross Ranch	9F5	8000	Feb. 27	35.7	10.0	6.7	7.1	5.8	172	11	G.F.
Trout Creek	9G1	8400	Feb. 23	14.4	2.9	4.5	9.1	5.5	53	3	G.F.
*Togwotee Pass	9F1	9600	Feb. 27	92.0	32.4		-	-	-	2	_
*Kendall	9F12	7900	Mar. 1	46.8	14.8	-	12.5	10.5	138	9	-
*Loomis Park	10F5	8500	Mar. 1	63.1	22.0	-	17.6	14.6	151	9	-
*Black Rock	1CF3	8600	Feb. 27	72.0	25.8	-	-	-	-	2	-
POPO AGIE RIVER	200)			1-00	-,						
Blue Ridge	8G2	9500	Feb. 22	38.6	10.1	14.8	15.7	8.2	123	13	G.F.
Grannier Meadows	8GL	9000	Feb. 22	47.2	13.5	17.5	16.8	11.0	123	15	G.F.
Larsen Creek	9G4	9000	Feb. 25	49.7	15.7	17.3	13.1	15.4	102	3	G.F.
Sawmill Glade	8G1	8500	Feb. 22	13.7	2.8	4.6	8.0	4.8	58	12	G.F.
South Pass	8G3	9000	Feb. 22	44.9	13.5	17.3	15.8	10.6	127	12	G.F.
Mulligan Park	965	8900	Mar. 1	48.5	15.7	11.7	10.6	10.0	157	10	-
BIG HORN RIVER (Wyoming)	/-/	-,00		7-07	-201						
Beavers Mill	9F8	8000	Mar. 1	32.1	8.1	7.7	6.9	7.6	107	3	GF
Owl Creek	8F1	8700	Mar. 6	25.7	5.5	5.8	6.0	5.8	95		GF
Timber Creek	9E2	9000	Feb. 26	16.9	5.8	1,1	7.5	5.8	100	3 3	Gr_



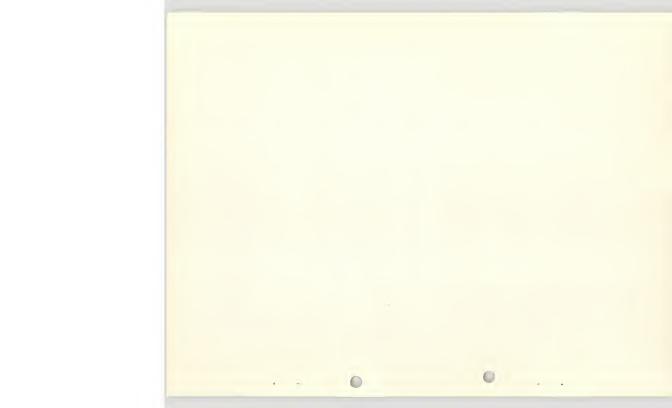
# MONTANA SNOW SURVEYS, MARCH 1, 1951

DRAINAGE BASIN			Date	Snow	A	Vater C	ontent (	Inches)			
AND	No.	Elev.	of	Depth					ge Data	Years	Ground
SNOW COURSE			Survey	(In.)	Mar. 1		Records	Marc		of	Surface
SNOW COURSE			1951	1951	1951	1950	1949	Avg.	%Avg.	Record	Condition
SHOSHONE RIVER											
East Entrance	10E6	7000	Feb. 28	3 41.4	5.8	9.6	14.4	9.9	59	3	
Sylvan Pass	10E5	7100	Mar. 2		15.0	14.5	15.7	11.5	130	9	
TONGUE RIVER											
Burgess R.S.	7EL	7900	Mar. 1	35.8	11.2	_	_	-	-	1	G.F.
Big Goose	7E2	7700	Mar. L		2.2	_		-	-	1	G.F.
Dome Lake	7E5	8800	Mar. 1		4.4	-	-	-	-	ī	G.F.
POWDER RIVER											
Muddy Pass	7E7	9700	Feb. 28	29.2	6.2	_	_	_	_	1	G.F.
Soldier Park	7E6	8700	Mar. L		4.1	-	-	-	-	1	G.F.
CHEYENNE RIVER											
(South Dakota)						ii.					
Upper Spearfish	1 S.D.	6500	Mer.	9.6	2.0	2.8	9.4	5.5	36	8	
Upper Castle	2 S.D.		Mar		3.6	1.2	9.7	5.4	67	8	
Deerfie ld	3 S.D.		Mar.		1.4	3.9	4.7	3.5	40	8	
	COLUME	RTA PTV	ER DRAINA	GE IN MO	NTANA						
KOOTENAI	00204	7231 1021									
Brush Creek	1/A/	5000	Feb. 2	40.0	11.0	14.0	17.0	13.8	80	5	
Fernie	Canada	3500	Feb. 2	7 27.8	10.3	10.2	9.3	7.4	139	13	
New Fernie	Canada	1,100	Feb. 2	3 50.9	14.3	-	-	-	-	1	
Gray Creek	Canada	5100	Feb. 26	60.1	18.6	16.1	17.8	17.5	106	3	
Kimberley	Cana da	3800	Mar.	35.1	10.4	9.2	7.2	5.4	192	11	
Marble Canvon	Canada	5000	Feb. 2	7 69.6	22.6	14.9	12.0	14.9	152	5	
Nelson Creek	Cana da	3050	Feb. 2	7 41.9	16.9	13.3	20.2	12.8	132	12	
Red Mountain, Mont.	15A1	6000	Mar.		19.9	20.2	18.7	15.4	129	15	
Sinclair Pass	Canada	4500	Feb. 2	7 36.7	9.3	6.0	3.7	5.4	172	6	
Sullivan Mine	Canada	5100	Feb. 2	3 54.1	15.9	15.6	12.7	12.9	123	6	
Upper Elk River	Canada	4400	Feb. 2	39.14	10.3	9.6	8.0	9.1	113	4	



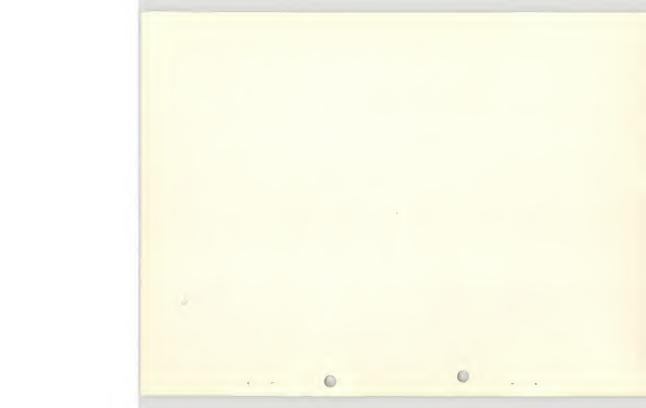
# MONTANA SNOW SURVEYS, MARCH 1, 1951

			Date	Snow	1/1	later Co	ntent (	Inches			
DRAINAGE BASIN	No.	Elev.	of	Depth					e Data	'ears	Ground
AND			Survey	(In.)	Mar. 1		Records	Marc		of	Surface
SNOW COURSE			1951	1951	1951	1950	1949	Avg.	%Avg.	Record	Condition
FLATHEAD RIVER											
Big Creek	13B3	6750	Feb. 28	108.4	37.6	38.7	35.0	34.6	106	11	
Brush Creek	1/A/	5000	Feb. 27	40.0	11.0	14.0	17.0	13.8	80	5	
Cattle Queen	13A1	4700	Mar. 2	90.5	31.2	35.1	31.1	28.1	111	7	
Desert Mountain	13A2	5600	Feb. 28	50.9	15.4	16.8	-	12.1	127	8	
Hell Roaring Divide	11,A3	5700	Feb. 28	81.4	26.7	-	-	-	-	2	
Kishenehn	11,82	4300	Feb. 25	29.9	8.3	8.8	7.9	8.2	101	6	
Limestone Pass	13B8	7600	Mar. 1	112.4	40.8	48.8	40.5	41.4	99	4	
Logan Creek	1/LA5	4300	Feb. 26	31.9	7.8	9.1	10.4	9.1	79	5	
Marias Pass	13A5	5250	Feb. 28	58.1	20.2	211.3	20.5	14.4	140	18	
North Fork Jocko	13B7	6330	Mar. L	110.4	40.0	45.0	37.4	35.4	113	11	
Rainy Lake	13B6	4.300	Feb. 26	15.0	4.3	13.6	14.3	11.8	127	5	
Snow Leb. #16	1349	5200									
Spotted Bear Mt.	13B2	7000	Mar. 1	40.1	12.5	17.5	19.3	19.1	66	4	
Strawberry Lake	13B10	6500	Feb. 28	103.6	35.9	40.5	39.4	38.6	93	3	
Trinkus Lake	13B1	6500	Feb. 28	97.2	31.6	43.3	37.4	37.7	84	Ĺ	
Trout Lake #2	13B11	3600	Mar. 1	46.3	14.7	-	71 014	7101	-	1	
Upper Holland Lake	13B5	7000	Mar. 1	83.4	30.5	36.8	32.2	32.3	95	1 4	
Basin Creek	13B1L	5000	Mar. 2	28.9	9.5	-	-	-	-	1	
Holbrook	13B13	4530	Mar. 2	29.3	9.0	_	_	_	_	i	
Quintonkon	13A13	3800	Feb. 28	41.0	12.9		-			i	
Twin Creeks	13B11	3580	Feb. 27	30.8	10.7			_	_	î	
	1)211	))00	2000 27	,000	1001					_	
UPPER CLARK FORK								1			
Chessman Res.	1205	6200	Mar. 1	12.7	3.1	3.4	7.1	4.4	70	16	
El Dorado Mine	1309	7800	Mar. 2	58.2	18.0	16.4	0		-	2	
Gold Creek Lake	1308	7200	Mar. 2	51.1	15.8	14.3	-		-	2	-00
Intergaard	13C4	61,50	Feb. 28	32.1	8.1	5.9	10.6	5.7	142	16	G.F.
North Fork Jocko	13B7	6330	Mar. L	110.4	40.0	45.0	37.4	35.4	113	11	
Pipestone Pass	1201	7200	Feb. 28	27.7	5.3	1.8	6.8	4.0	132	14	



# MONTANA SNOW SURVEYS, MARCH 1951

			Date	Snow	l A	Vater C	ontent	(Inches	)		
DRAINAGE BASIN	No.	Elev.	of	Depth					ge Data	Years	Ground
AND			Survey	(In.)	Mar. 1		Records	Mar		of	Surface
SNOW COURSE			1951	1951	1951	1950	1949	Avg.	%Avg.	Record	Condition
UPPER CLARK FORK (Cont	inued)										
Rainy Lake	13B6	4200	Feb. 26	15.0	4.3	13.6	14.3	11.8	127	5	
Stemple Pass	1301	6900	Feb. 28	35.9	9.1	8.2	12.1	8.0	111	18	
Stuart Mill	1306	6500	Feb. 28	24.0	6.2	5.5	8.9	4.8	129	16	G.F.
Picnic Grounds	1206	6500	Feb. 28	21.9	5.0	2.5	6.3	3.8	132	7	G.F.
Southern Cross	1305	6500	Feb. 28	20.8	5.5	2.6	6.4	4.2	131	16	G.F.
Tenmile, Lower	1202	6250	Mer. 2	26.0	6.6	5.4	8.1	5.6	118	17	
Tenmile, Middle	1203	6800	Mar. 2	39.6	9.7	8.4	11.2	8.1	120	18	
Tenmile, Upper	12C4	8000	Mar. 3	45.0.	12.9	10.6	13.2	10.4	124	17	
*Lookout	15B2	5250	Feb. 28	90.0	32.2	36.4	46.0	29.4	110	27	
BITTERROOT											
Gibbons Pass	13D2	7100	Feb. 28	73.7	23.8	25.2	26.2	18.4	130	18	
Mud Creek Pasture	1hc1	4500	Mar. 1	19.7	6.5	11.2	15.4	8.4	77	9	
Nezperce Camp	1/102	5580	Feb. 27	46.0	12.8	11.8	17.6	11.1	115	1L.	
Nezperce Pass	14D1	6575	Feb. 27	51.8	16.8	14.6	20.4	15.0	112	15	
			CC	RRECTIO	N TO FE	RUARY	BULLETI	N			
WYOMING								-			
TONGUE RIVER											
Big Goose R.S.	7E2	7700	Feb. 1	11.5	2.6			~~~		1	
		FEBRU	ARY DATA F	ECEI VEL	AFTER E	BULIETT	N WAS D	JSTRIBU	red		
POWDER RIVER WYOMING	}										
North Powder River	new cou	r se	Feb.14	24.6	5.0			00.00.00		1	
UPPER CLARK FORK MONT	ANA										
Intergaard	13C4	64,50	Jan.31	24.2	6.2						
Picnic Grounds	1206	6500	Jan. 31	18.1	11.7						
Southern Cross	13C5	6500	Jan. 31	16.5	14.6						
Stuart Mill	1306	6500	Jan. 31	18.0	5.2						





Federal - State - Private

## COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"